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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,672	10/16/2003	Bruce B. Doris	FIS920030247US1	2671
29625	7590	05/11/2005	EXAMINER	
MCGUIRE WOODS LLP 1750 TYSONS BLVD. SUITE 1800 MCLEAN, VA 22102-4215			ISAAC, STANETTA D	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/605,672

Applicant(s)

DORIS ET AL.

Examiner

Stanetta D. Isaac

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

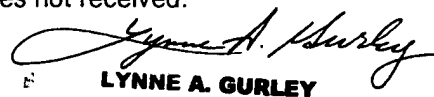
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY

PRIMARY PATENT EXAMINER

TC 2800, AU 2812

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/28/04.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the RCE filed on 4/4/05. Currently, claims 1 and 4-18 are pending.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/04/05 has been entered.

Information Disclosure Statement

The information disclosure statement (IDS) was submitted on 6/28/04 was filed after the mailing date of the Office Action on 4/28/04. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the at least one overhang being in the parallel and transverse direction must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Specifically, the specification lacks antecedent basis for the first shallow trench side being parallel and the second shallow trench side being transverse.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

JA
Claims 1, ^{and} 4-18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the NFET either having overhangs being parallel to or transverse to the direction of current flow (see figures 9 and 11, respectively), the specification does not reasonably provide enablement for one isolation region or a first shallow trench isolation having a first shallow trench isolation side parallel to the direction of current flow, and having a second shallow trench isolation side in a direction transverse to the direction of current flow. From the description and drawings it appears that either the shallow trench isolation in the

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NFET has overhangs, which are all parallel or all transverse. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Clarification is requested.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Trivedi US Patent 6,583,060 in view of Jin et al, US 5940,716.

Trivedi discloses the semiconductor structure substantially as claimed. See figures 1-15, and corresponding text, where Trivedi shows, pertaining to claim 7, a semiconductor structure formed on a substrate, comprising: an n-channel field effect transistor having a source **111**, a drain **111**, a gate **70**, and a direction of current flow from the source to the drain (figure 12; col. 4, lines 57-67; col. 5, lines 29-55); and a first shallow trench isolation **50** for the n-channel field effect transistor the first shallow trench isolation having a first shallow trench isolation side in a direction parallel to the direction of current flow for the n-channel field effect transistor. In addition, Trivedi shows, pertaining to claim 8, wherein the first shallow trench for the n-channel field effect transistor further comprises: a second shallow trench isolation side being transverse to the first shallow trench isolation side in a direction transverse to the direction of current flow for the n-channel field effect transistor (figure 12; col. 5, lines 45-55, **Note:** ~~that~~ the Examiner

JA

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JA. takes ^{the} ~~to~~ position that it is inherent that a trench isolation region will have both parallel and transverse directions, based on the admitted prior art disclosed ⁱⁿ ~~on~~ figure 7, and paragraph [0034], where ^a ~~an~~ shallow trench isolation will include four sides ^{that} ~~the~~ surround the active device region).

JA. However, Trivedi fails to show, pertaining to claim 7, the first shallow trench isolation side having a least one overhang configured to prevent oxidation induced stress in a direction parallel to the direction of current flow for the n-channel field effect transistor. In addition, Trivedi fails to show, pertaining to claim 8, the second shallow trench isolation side having at least one overhang configured to prevent oxidation induced stress in a direction transverse the direction of current flow for the n-channel field effect transistor.

Jin teaches, in figures 1-24, and corresponding text, the first shallow trench isolation side having at least one overhang that is configured in the parallel direction. In addition, Jin suggest that at least one overhang may also be configured in the transverse direction, since the isolations appears to surround the active regions (figure 14; col. 2, lines 10-22; col. 4, lines 10-13; col. 5, lines 10-21).

It would have been obvious to one of ordinary skill in the art to substitute, the first shallow trench isolation side having a least one overhang configured to prevent oxidation induced stress in a direction parallel to the direction of current flow for the n-channel field effect transistor; and the second shallow trench isolation side having at least one overhang configured to prevent oxidation induced stress in a direction transverse the direction of current flow for the n-channel field effect transistor, in the method of Trivedi, pertaining to claims 7 and 8, according to the teachings of Jin, with the motivation to eliminate the conventionally known problem of stress, such as the prevention of bird's beak, which causes a generation of leakage currents,

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resulting in a deterioration of the characteristics of the devices formed in an adjacent active region.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanetta D. Isaac whose telephone number is 571-272-1671. The examiner can normally be reached on Monday-Friday 9:30am -6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stanetta Isaac
Patent Examiner
April 29, 2005


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812